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Dictyoaquaphila appendiculata gen. & sp. nov. from submerged wood from Brazil

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Abstract — *Dictyoaquaphila appendiculata*, collected from submerged wood in Brazil, is described and illustrated as a new genus and species. It is distinguished by distinct, erect, septate, subhyaline to very pale brown conidiophores, mono- and polyblastic conidiogenous cells, and fusiform, elliptical to shortly clavate, brown separating cells. The conidia are dictyoseptate, broad ellipsoidal-fusiform to prolate subglobose, dark brown, usually with 1–3 divergent, narrow cylindrical, hyaline appendages at the apical cell, and sometimes with 1–2(–3), narrow cylindrical, hyaline appendages arising from the basal cell.

Key words — freshwater fungi, neotropic, taxonomy

Introduction

The diversity of conidial fungi in the Brazilian Amazon Forest has received little attention, especially in freshwater habitats. During a survey of hyphomycetes associated with submerged plant material in streams from Pará state, a conspicuous fungus was collected. This fungus shows remarkable differences from all previously described genera (Seifert et al. 2011) and is described here as new.

Materials & method

Samples of submerged litter were placed in plastic bags for transport to the laboratory, where they were placed in Petri dish moist chambers and stored at 25°C for 30 days in a 170 L polystyrene box with 200 mL sterile water plus 2 mL glycerol (Castañeda-Ruiz 2005). Mounts were prepared in PVL (polyvinyl alcohol, lactic acid, and phenol) and measurements were made at a ×1000 magnification. Micrographs were obtained with an Olympus BX51 microscope equipped with bright field and Nomarski interference optics. The specimens including holotype are deposited in the Herbarium of Universidade Estadual de Feira de Santana, Bahia, Brazil (HUEFS).

Taxonomy

Dictyoaquaphila J.S. Monteiro, L.B. Conc., M.F.O. Marques, Gusmão & R.F. Castañeda **gen. nov.**

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Differs from *Dictyodesmium* by its effuse colonies, polyblastic and swollen conidiogenous cells, fusiform separating cells, and dictyoseptate conidia with several cylindrical filamentous hyaline appendages at one or both end cells.

Type species: *Dictyoaquaphila appendiculata* J.S. Monteiro et al.

Etymology: Greek, *dictyo-*, referring to the transverse, longitudinal, and oblique conidial septa; Latin, *–aqua-* meaning water; and Greek, *–phila* meaning loving.

Conidial fungi. Colonies on the natural substratum effuse, brown or dark brown. Conidiophores distinct, single, unbranched, septate, subhyaline to pale brown. Conidiogenous cells mono- and polyblastic, integrated or discrete, determinate or indeterminate with sympodial extensions. Conidiogenous loci flatted or slightly broad denticulate, subhyaline or pale pigmented. Separating cells swollen, fusiform, ellipsoidal or shortly clavate, brown or dark brown. Conidial secession schizolytic. Conidia solitary, dictyoseptate, broad ellipsoid-fusiform to prolate subglobose, brown to dark brown, cuneate to subulate or subconical at the end cells, with 0–3 divergent filiform or narrow cylindrical, hyaline appendages at the ends.

Dictyoaquaphila appendiculata J.S. Monteiro, L.B. Conc., M.F.O. Marques, Gusmão & R.F. Castañeda **sp. nov.** Fig 1–3

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Differs from all *Dictyodesmium* spp. by its effuse and mono- or polyblastic colonies, sometimes with sympodial extensions, and its indeterminate conidiogenous cells from which arise swollen, fusiform, or shortly clavate separating cells and dictyoseptate conidia, appendiculate at the end cells.

Type: Brazil, Pará State: Santa Bárbara, Parque Ecológico de Gumma, 1°13′S 48°17′W, on decaying submerged wood in a river, 29.VII.2012, coll. J.S. Monteiro (**Holotype**: HUEFS 216013).

Etymology: Latin, *appendiculata*, referring to the small conidial appendages.

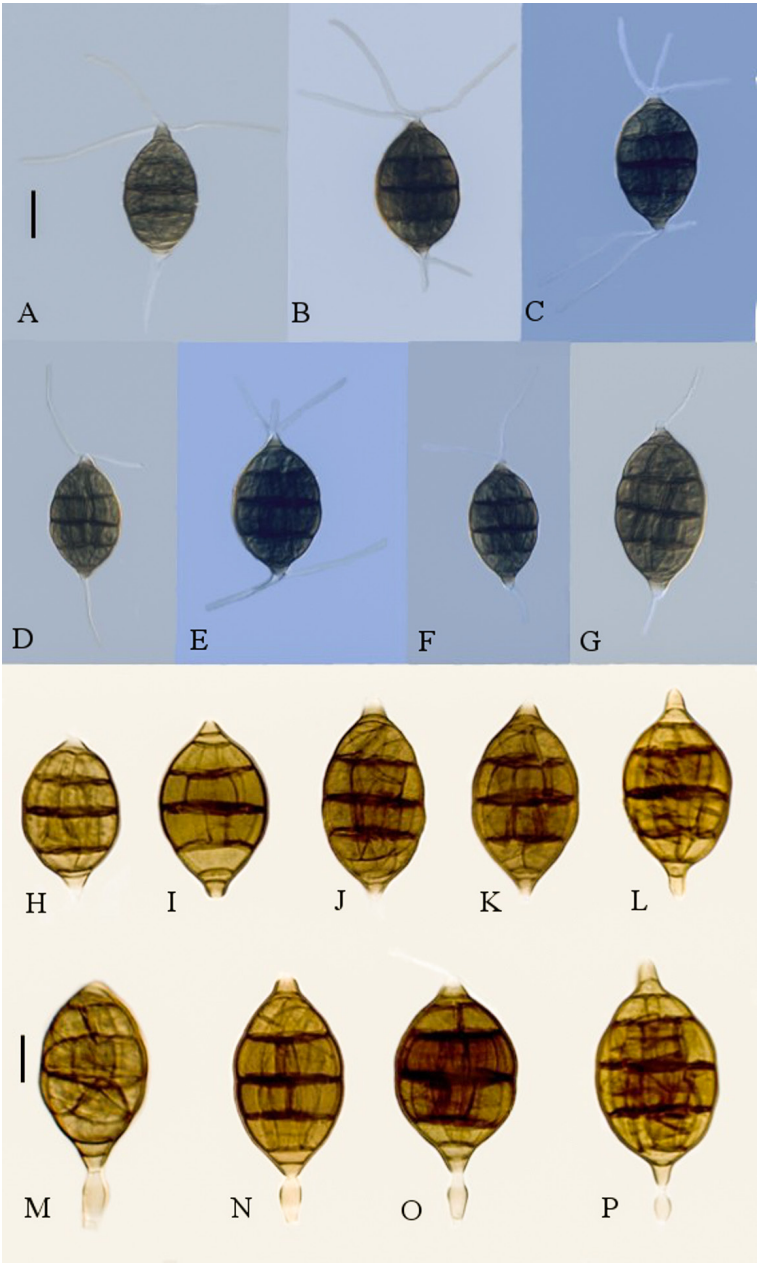

Fig. 1. *Dictyoaquaphila appendiculata* (ex holotype HUEFS 216013). Conidia. Bar = 10 μm.

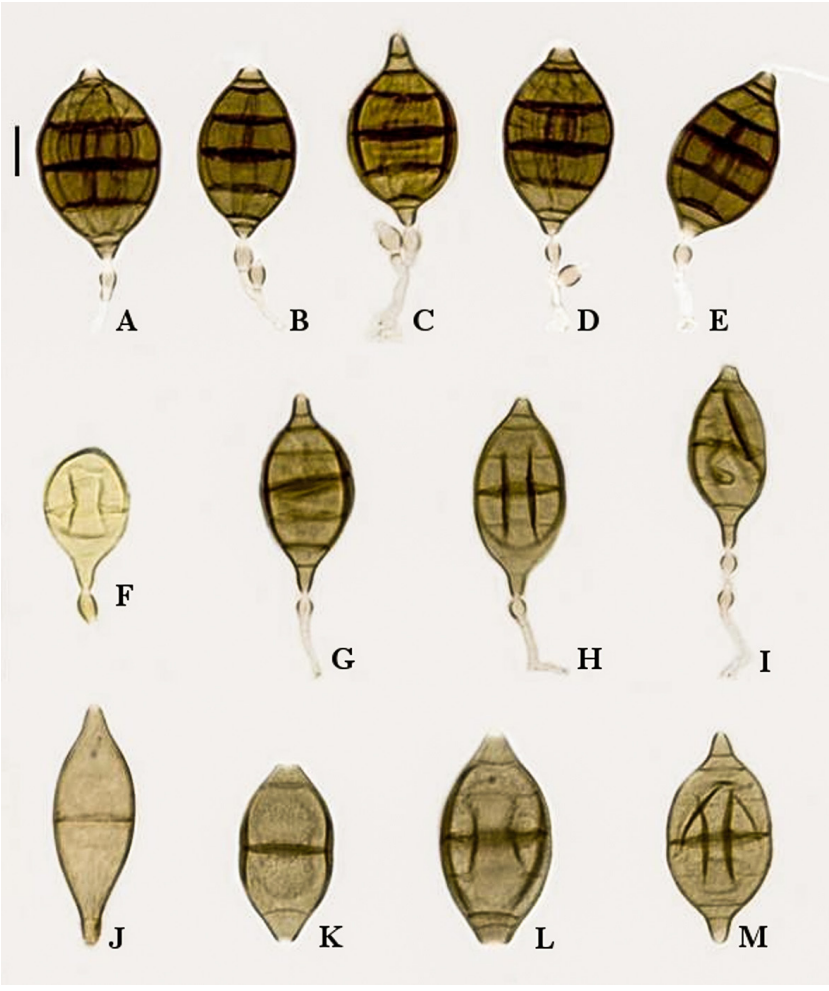

Fig. 2. *Dictyoaquaphila appendiculata* (ex holotype HUEFS 216013).
A–I. conidiogenous cells, separating cells, and conidia; J–M. conidia. Bar = 10 µm.

Colonies on the natural substratum effuse, dark brown to black. Mycelium mostly immersed. Conidiophores distinct, single or moderately branched, erect, bent or flexuous, subhyaline or very pale brown, 0–3-septate, 20–40 × 3–5 µm, smooth. Conidiogenous cells mono- and polyblastic, integrated, sometimes discrete, determinate or indeterminate with sympodial extensions, terminal and intercalary, subhyaline to very pale brown, 3–5 × 1.5–3 µm.

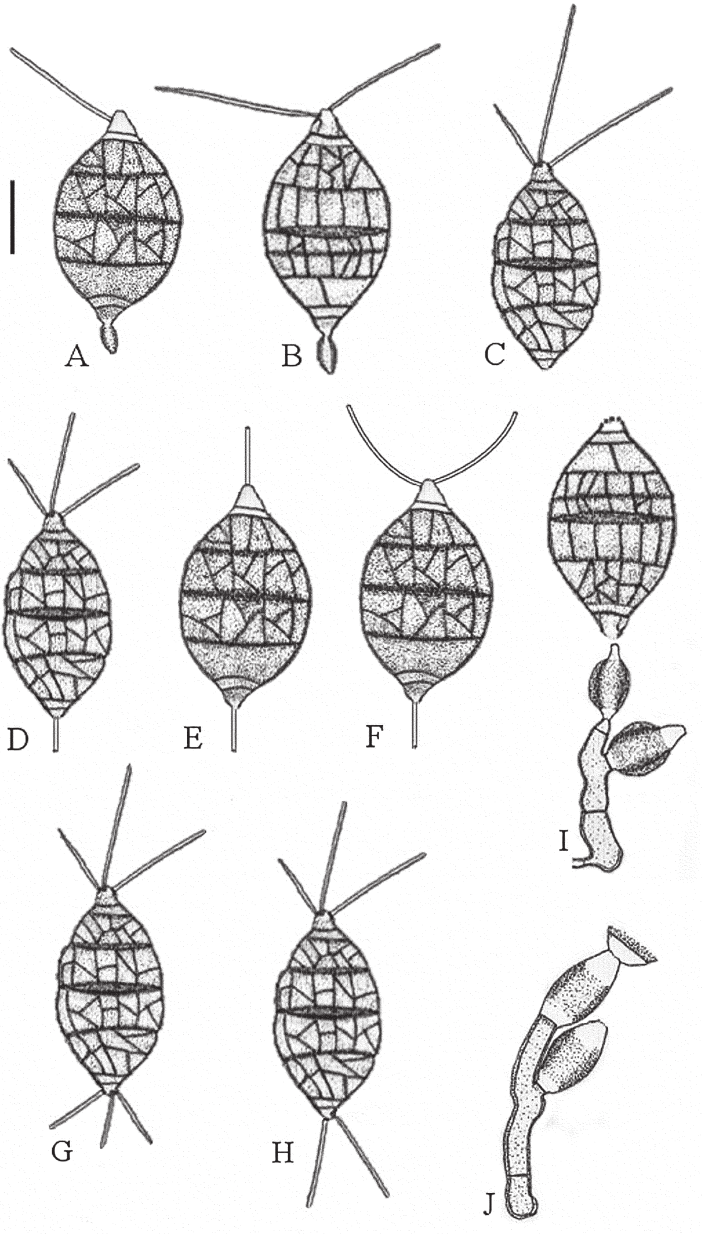

Fig. 3. *Dictyoaquaphila appendiculata* (ex holotype HUEFS 216013).
A–H. conidia; I–J. conidiophores, conidiogenous cells and separating cells. Bar = 10 μm.

Separating cells swollen, fusiform, ellipsoidal or shortly clavate, brown or dark brown at the margin, pale brown at the middle, suhyaline at the ends, sometimes in a short chains with a secondary cell, 7–10 × 3.5–5 µm. Conidial secession schizolytic. Conidia solitary, acrogenous, dictyoseptate, broad ellipsoid-fusiform to prolate subglobose, 37–45 × 17–27 µm, brown to dark brown, black at the transverse septa, and subhyaline or hyaline at the cuneate to subulate or subconical at the end cells, mostly with 0–3 divergent, filiform or narrow cylindrical, hyaline, smooth apical appendages, 20–42 × 1–1.5 µm and sometimes 0–2(–3) divergent, filiform or narrow cylindrical, hyaline, smooth basal appendages, 20–35 × 1–1.5 µm.

Additional specimen examined: **BRAZIL**, **Bahia state**: Pindobaçu, Serra da Fumaça, on decaying submerged wood in stream, 7.XII.2012, L.B. Conceição (HUEFS 216020).

Comments: *Dictyoaquaphila* is superficially similar to *Dictyodesmium* S. Hughes, *Dictyorostrella* U. Braun, *Muiaria* Thaxt., and *Xenostigmina* Crous, all of which have short distinct conidiophores and a blastic conidial ontogeny but which lack separating cells and filiform appendages (Seifert et al 2011). Filiform appendages, which are widely distributed in the aero-aquatic and freshwater hyphomycete ecological group, probably function in anchoring the conidia to substrates (Cai et al. 2006, Ingold 1975, Seifert et al. 2011). The function of separating cells in freshwater hyphomycetes has not been documented, although Kendrick (2003) did cover some hyphomycete genera with biconic conidia attached at the separating cells.

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